

Amendments to the Claims

Claim 1 (previously amended): A composition comprising:

(a) a 2-cyanoacrylate monomer of the formula  $H_2C=C(CN)-COOR$ , wherein R is selected from the group consisting of  $C_{1-15}$  alkyl, alkoxyalkyl, cycloalkyl, alkenyl, aralkyl, aryl, allyl and haloalkyl groups,

(b) a metallocene component,

(c) a polymerisingly effective amount of a photoinitiator component other than the metallocene component to render the composition capable of photocuring in air upon exposure to at least one type of electromagnetic radiation selected from the group consisting of ultraviolet light, visible light, electron beam, x-ray and infrared radiation, and

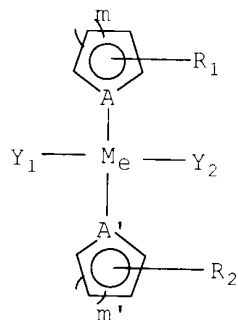
(d) one or more sulfur-containing compounds selected from the group consisting of sulfonates, sulfinates, sulfates, and sulfites.

Claims 2-3 (previously cancelled)

Claim 4 (currently amended): The composition according to Claim 1, wherein the 2-cyanoacrylate monomer is selected from the group consisting of methyl cyanoacrylate, ethyl-2-cyanoacrylate, propyl cyanoacrylates, butyl cyanoacrylates, octyl cyanoacrylates, allyl-2-cyanoacrylate,  $\beta$ -methoxyethyl-2-cyanoacrylate and combinations thereof.

Claim 5 (currently amended): The composition according to Claim 1, wherein the 2-cyanoacrylate monomer is ethyl-2-cyanoacrylate.

Claim 6 (currently amended): The composition according to Claim 1, wherein the metallocene component includes materials within the following structure:



wherein  $R_1$  and  $R_2$  [may] occur at least once on each ring, [may be] are the same or different and [may be] are selected from the group consisting of H; any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms; acetyl; vinyl; allyl; hydroxyl; carboxyl;  $-(CH_2)_n-OH$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8;  $-(CH_2)_n-COOR_3$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $R_3$  [may be] is a member selected from the group consisting of H; Li; Na; any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms;  $-(CH_2)_{n'}$ , wherein  $n'$  [may be] is an integer in the range of 2 to about 8;  $-(CH_2)_n-OR_4$ , wherein  $n$  [may be] is

an integer in the range of 1 to about 8 and  $R_4$  [may be] is any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms; and  $-(CH_2)_n-N^+(CH_3)_3 X^-$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $X$  [may be] is selected from the group consisting of  $Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $ClO_4^-$  and  $BF_4^-$ ;

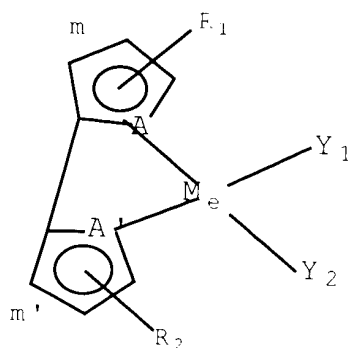
$Y_1$  and  $Y_2$  may or may not be present, but when present at least once [may be] are the same or different and [may be] are selected from the group consisting of  $H$ ,  $Cl^-$ ,  $Br^-$ ,  $I^-$ , cyano, methoxy, acetyl, hydroxy, nitro, trialkylamines, triaryamines, trialkylphospines, triphenylamine, and tosyl;

$A$  and  $A'$  [may be] are the same or different and may be  $C$  or  $N$ ;

$m$  and  $m'$  [may be] are the same or different and may be 1 or 2; and

$M_e$  is selected from the group consisting of  $Fe$ ,  $Ti$ ,  $Ru$ ,  $Co$ ,  $Ni$ ,  $Cr$ ,  $Cu$ ,  $Mn$ ,  $Pd$ ,  $Ag$ ,  $Rh$ ,  $Pt$ ,  $Zr$ ,  $Hf$ ,  $Nb$ ,  $V$  and  $Mo$ .

Claim 7 (currently amended): The composition according to Claim 1, wherein the metallocene component includes materials within the following structure:

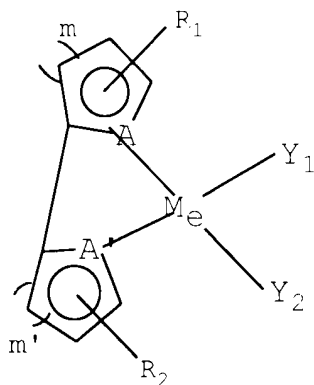


wherein  $R_1$  and  $R_2$  [may be] are the same or different, and each is a member selected from the group consisting of H; any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms, acetyl; vinyl; allyl; hydroxyl; carboxyl;  $-(CH_2)_n-OH$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8;  $-(CH_2)_n-COOR_3$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $R_3$  [may be] is any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms, H, Li, Na, or  $-(CH_2)_{n'}$ , wherein  $n'$  [may be] is an integer in the range of 2 to about 8;  $-(CH_2)_n-OR_4$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $R_4$  [may be] is any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms; and  $-(CH_2)_n-N^+(CH_3)_3 X^-$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $X$  [may be] is a member selected from the group consisting of  $Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $ClO_4^-$  and  $BF_4^-$ ; and

$Me$  is selected from the group consisting of Fe, Ti, Ru, Co, Ni, Cr, Zr, Hf, Nb, V and Mo.

Claim 8 (original): The composition according to Claim 6, wherein  $M_e$  is selected from the group consisting of Ti, Cr, Cu, Mn, Ag, Zr, Hf and Mo.

Claim 9 (currently amended): The composition according to Claim 1, wherein the metallocene component includes materials within the following structure:



wherein  $R_1$  and  $R_2$  [may] occur at least once on each ring, [may be] are the same or different and [may be] are selected from the group consisting of H; any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms; acetyl; vinyl; allyl; hydroxyl; carboxyl;  $-(CH_2)_n-OH$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8;  $-(CH_2)_n-COOR_3$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $R_3$  [may be] is a member selected from H; Li; Na; any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms;  $-(CH_2)_n$ ,

wherein  $n'$  [may be] is an integer in the range of 2 to about 8;  $-(CH_2)_n-OR_4$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $R_4$  [may be] is any straight- or branched-chain alkyl constituent having from 1 to about 8 carbon atoms; and  $-(CH_2)_n-N^+(CH_3)_3 X^-$ , wherein  $n$  [may be] is an integer in the range of 1 to about 8 and  $X$  [may be] is a member selected from the group consisting of  $Cl^-$ ,  $Br^-$ ,  $I^-$ ,  $ClO_4^-$  and  $BF_4^-$ ;

$Y_1$  and  $Y_2$  may or may not be present, but when present at least once [may be] are the same or different and [may be] are selected from from the group consisting of  $H$ ,  $Cl^-$ ,  $Br^-$ ,  $I^-$ , cyano, methoxy, acetyl, hydroxy, nitro, trialkylamines, triarylamines, trialkylphosphines, triphenylamine, and tosyl;

$A$  and  $A'$  [may be] are the same or different and may be  $C$  or  $N$ ;

$m$  and  $m'$  [may be] are the same or different and may be 1 or 2; and

$M_e$  is selected from the group consisting of  $Fe$ ,  $Ti$ ,  $Ru$ ,  $Co$ ,  $Ni$ ,  $Cr$ ,  $Cu$ ,  $Mn$ ,  $Pd$ ,  $Ag$ ,  $Rh$ ,  $Pt$ ,  $Zr$ ,  $Hf$ ,  $Nb$ ,  $V$  and  $Mo$ .

Claim 10 (original): The composition according to Claim 9, wherein  $R_1$  and  $R_2$  are each  $H$ ;  $Y_1$  and  $Y_2$  are each  $Cl$ ;  $A$  and  $A'$  are each  $N$ ;  $m$  and  $m'$  are each 2; and  $Me$  is  $Ru$ .

Claim 11 (currently amended): The composition according to Claim 1, wherein the metallocene component is selected from the group consisting of diaryl phosphino metal-complexed ferrocenes, bis-alkyl ferrocenes, and  $M_e[CW_3-CO-CH=C(O^-)-CW'_3]_2$ , wherein  $M_e$  is a member selected from the group consisting of Fe, Ti, Ru, Co, Ni, Cr, Cu, Mn, Pd, Ag, Rh, Pt, Zr, Hf, Nb, V and Mo, and W and W' [may be] are the same or different and [may be] are selected from the group consisting of H and halogen.

Claim 12 (currently amended): The composition according to Claim 1, wherein the metallocene component is a member selected from the group consisting of ferrocenes, titanocenes, [and derivatives] and combinations thereof.

Claim 13 (previously amended): The composition according to Claim 1, wherein the metallocene component is ferrocene.

Claim 14 (previously amended): The composition according to Claim 1, wherein the photoinitiator component is selected from the group consisting of 1-hydroxycyclohexyl phenyl ketone, 2-methyl-1-2-morpholino propan-1-one, benzophenone, 2-benzyl-2-N,N-dimethylamino-1-(4-morpholinophenyl)-1-butanone, 2,2-dimethoxy-2-phenyl acetophenone, bis(2,6-dimethoxybenzoyl-2,4,4-trimethyl pentyl) phosphine oxide, 2,4,6-trimethylbenzoyldiphenylphosphine oxide, bis(2,4,6-trimethyl benzoyl) phenyl

phosphine oxide, 2-hydroxy-2-methyl-1-phenyl-propan-1-one, alkyl pyruvates, aryl pyruvates and combinations thereof.

Claim 15 (previously cancelled)

Claim 16 (original): The composition according to Claim 1, further comprising a member selected from the group consisting of viscosity-modifying agents, rubber toughening agents, thixotropy rendering agents, thermal stabilizing agents and combinations thereof.

Claim 17 (previously amended): The composition according to Claim 1, wherein the composition is useful as an adhesive, a sealant or a coating.

Claim 18 (previously amended): A method of polymerizing a composition, said method comprising the steps of:

(a) providing an amount of the composition according to Claim 1: and

(b) subjecting the composition to a sufficient amount of said electromagnetic radiation to cure the composition.

Claim 19 (currently amended): The composition according to [any one of] Claim[s] 1[-14 and 17] in a one-part formulation.

Claim 20 (currently amended): The composition according to Claim 1, wherein the cyanoacrylate [component] monomer includes ethyl-2-cyanoacrylate which is present in an



amount within the range of about 97.9% by weight to about 99.4% by weight of the total composition, the metallocene component is ferrocene which is present in an amount of about 0.1% by weight of the total composition, the photoinitiator component includes the combination of bis(2,6-dimethoxybenzoyl-2,4,4-trimethyl) pentyl phosphine oxide and 2-hydroxy-2-methyl-1-phenyl-propan-1-one which is present in an amount in the range of about 0.5% to about 2% by weight of the total composition, and the sulfur-containing compound is present in an amount in the range of about 0.1% to about 10% by weight of the total composition.

Claim 21 (currently amended): The composition according to Claim 1, wherein the cyanoacrylate component includes: ethyl-2-cyanoacrylate which is present in an amount within the range of about 98.715% to about 98.75% by weight of the total composition and  $\text{BF}_3$  in an amount within the range of about 0.04% to about 0.075% by weight of the total composition, the metallocene component is ferrocene which is present in an amount of about 0.02% by weight of the total composition, the photoinitiator component includes the combination of bis(2,6-dimethoxybenzoyl-2,4[-],4-trimethyl) pentyl phosphine oxide and 2-hydroxy-2-methyl-1-phenyl-propan-1-one which is present in an amount of about 1.2% by weight of the total composition, and the sulfur-containing compound is present in an amount in the range of about 0.1% to about 10% by weight of the total composition.

Claim 22 (previously amended): A reaction product formed from the composition according to Claim 1, after exposing the composition to electromagnetic radiation effecting to cure the composition.

Claim 23 (previously amended): An article assembled with a composition according to Claim 1, selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry.

Claim 24 (previously amended): A method of manufacturing an article comprising:

selecting portions of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses or jewelry;

applying a composition according to Claim 1 to said portions; and

polymerizing said composition to thereby assemble said portions.

Claim 25 (previously amended): A method of repairing an article, comprising:

selecting a broken article selected from the group consisting of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses and jewelry;

applying a composition according to Claim 1 to said broken article; and

polymerizing said composition to thereby repair said broken article.

Claim 26 (currently amended): A method of using a one-part composition according to Claim 19 in the assembly of an article which ordinarily would be assembled by applying onto a substrate a primer, followed by an adhesive composition, comprising:

selecting portions of needles, syringes, lancets, hypodermics, injectors, bodily fluid collector sets, cannula/hub assemblies, cannula/tube assemblies, tube sets, intravenous sets, fluid delivery and withdrawal sets, suction tubes, anesthesia masks, face masks, surgical masks, angioplast catheters, balloon catheters, disc drives, magnetic sensors, battery holding cartridges, loud speakers, phase holograms, lenses or jewelry;

applying a composition according to Claim 1 to said portions; and

polymerizing said composition to thereby assemble said portions.

Claim 27 (currently amended): The composition according to Claim [16, 17 or] 19, having a viscosity within the range of about 1 to about 15 cps.

Claim 28 (currently amended): The composition according to Claim [16, 17 or] 19, having a viscosity within the range of about 100 to about 300 cps.

Claim 29 (currently amended): The composition according to Claim [16, 17 or] 19, having a viscosity within the range of about 600 to about 1000 cps.

Claim 30 (currently amended): The composition according to Claim [26] 19, for use in the manufacture of articles using a wicking application.

Claim 31 (original): The composition according to Claim 27, for use in the manufacture of articles having molded polymeric parts to be bonding together.

Claim 32 (original): The composition according to Claim 28, for use in the manufacture of articles having porous substrates with gaps greater than about 0.5 mil therebetween,

Claim 33 (previously added): The composition according to Claim 1, which cures to provide a non-tacky surface in less than 5 seconds.

Claim 34 (previously added): The composition according to Claim 1, wherein the photoinitiator is a member selected from the group consisting of UV photoinitiators, visible light photoinitiators, UV/visible light photoinitiators, and combinations thereof.

Claim 35 (previously added): The composition according to Claim 1, wherein the photoinitiator is a member selected from the group consisting of dl-camphorquinone, bis( $\eta^5$ -2,4-cyclopentadien-1-yl)-bis[2,6-difluoro-3-(1H-pyrrol-1-yl)phenyl]titanium, and combinations thereof.

Claim 36 (previously added): The composition according to Claim 1, wherein the composition has a viscosity in a range selected from the group consisting of 1-3 cps, 1-15 cps, 100-300 cps, and 600-1000 cps.